

A report on identification of a unique hygrine like compound from chloroform extract of *Anisochilus carnosus* (L.f.) Wall

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Article History

Received: 30 March 2020

Accepted: 08 May 2020

Published: May 2020

Citation

Rupali P. Shirsat, Syed Imran, Deepak K. Koch. A report on identification of a unique hygrine like compound from chloroform extract of *Anisochilus carnosus* (L.f.) Wall. *Drug Discovery*, 2020, 14(33), 130-134

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ISSN 2278-540X; EISSN 2278-5396

General Note



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ABSTRACT

Anisochilus carnosus (Lamiaceae) is annual herb with traditional medicinal properties as antiulcer, expectorant, stimulant and antihepatic agent. It is rich in phytochemical composition especially phenolic compounds. Here, a new compound was predicted from the spectral studies of chloroform leaf extract of the plant. After analysis of preliminary phytochemical composition, the IR, NMR and MS analysis was done. From the spectral data of IR, NMR spectra and Mass analysis of the extract showed C-N-, C=O- stretching; five membered ring structure (δ 7.5-8.1 ppm) and molecular ion peak at 141.31. From this, it was interpreted that the compound is unique and revealed almost similar spectral properties to that of hygrine, a pyrrolidine alkaloid, which was not reported earlier from any member of family lamiaceae.

Keywords: *Anisochilus carnosus*, Phytochemical composition, Spectral properties, Hygrine.

1. INTRODUCTION

Anisochilus carnosus (L.f.) Wall., is an annual, erect herb of Lamiaceae, commonly called as Kapuri, a common inhabitant of higher altitudes among small rocks (Ayyanar et al., 2005 and Imran, 2013). The plant is used traditionally to cure cough, fever, eczema,

stomachache, hepatitis and inflammation (Arinathan et al., 2003; Ganeshan et al., 2004; Ignacimuthu et al., 2006 and Kambale et al., 2010). This plant was reported earlier having rich phytochemical composition containing phenolic compounds, flavonoids, phytosterols, triterpenoids and active compounds like leutiolin, apigenin, β -selinene, caryophyllene and camphor (Khare, 2007; Felice et al., 2008 Felice et al, 2008 and Lobo et al., 2012 and Imran 2013). Present study reveals identification of a new hygrine like compound from the chloroform leaf extract of *A. carnosus*.

2. MATERIALS AND METHODS

For the present work, the plant material was collected from Chikhaldara forest range, Amravati Division (MS) India. The plant was identified taxonomically using flora of Marathwada (Naik, 1998) and flora of Maharashtra (Singh and Karthikeyan, 2000). The leaf material was shade dried for about 10 days and then powdered; this powder was used for phytochemical analysis. The phytochemical analysis was done using ethanol, distilled water and chloroform as solvents (Harborne, 1998). After preliminary analysis, the extracts were sent for FTIR, NMR and Mass analysis. The facility of FTIR, NMR and Mass analysis was availed from Central Drug Research Institute, Lucknow, India and the spectra's were interpreted in light of recent researches and standard references.

3. RESULTS AND DISCUSSION

FTIR analysis of the chloroform extract of *Anisochilus carnosus* showed two most prominent identifiable wave numbers i.e. 1457 with C–N – Stretching and 1723 with C=O – Stretching. The NMR analysis showed one five membered ring-proton C-C-H, C-H proton for CH₃ group and C-H for CH₃ due to electronegative nitrogen. The Mass analysis indicates that the compound was with molecular ion peaks mass 141.31 with small fragment 43 and larger fragment of 98 (table-1 and fig.1, 2 & 3). From this data, it was predicted that, the compound might be hygrine, a pyrrolidine alkaloid. This is the first report indicating presence of hygrine like compound in any member of lamiaceae.

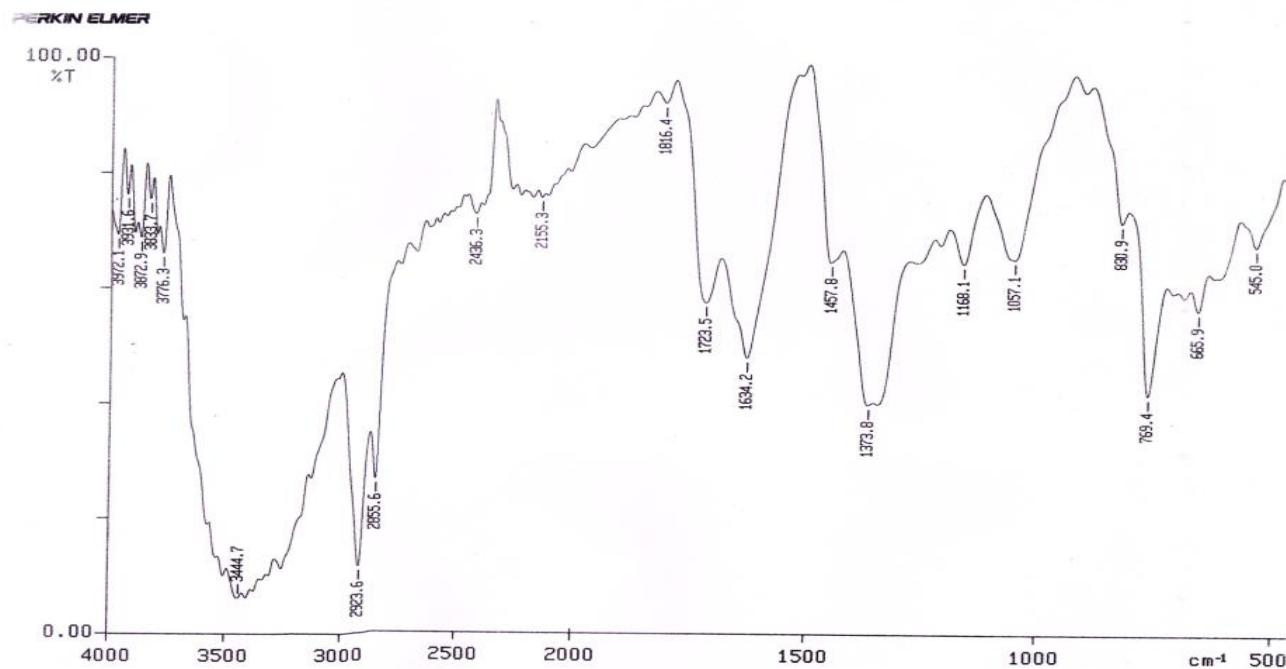
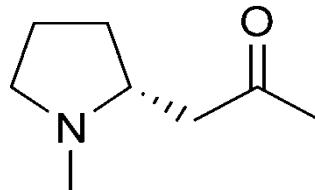
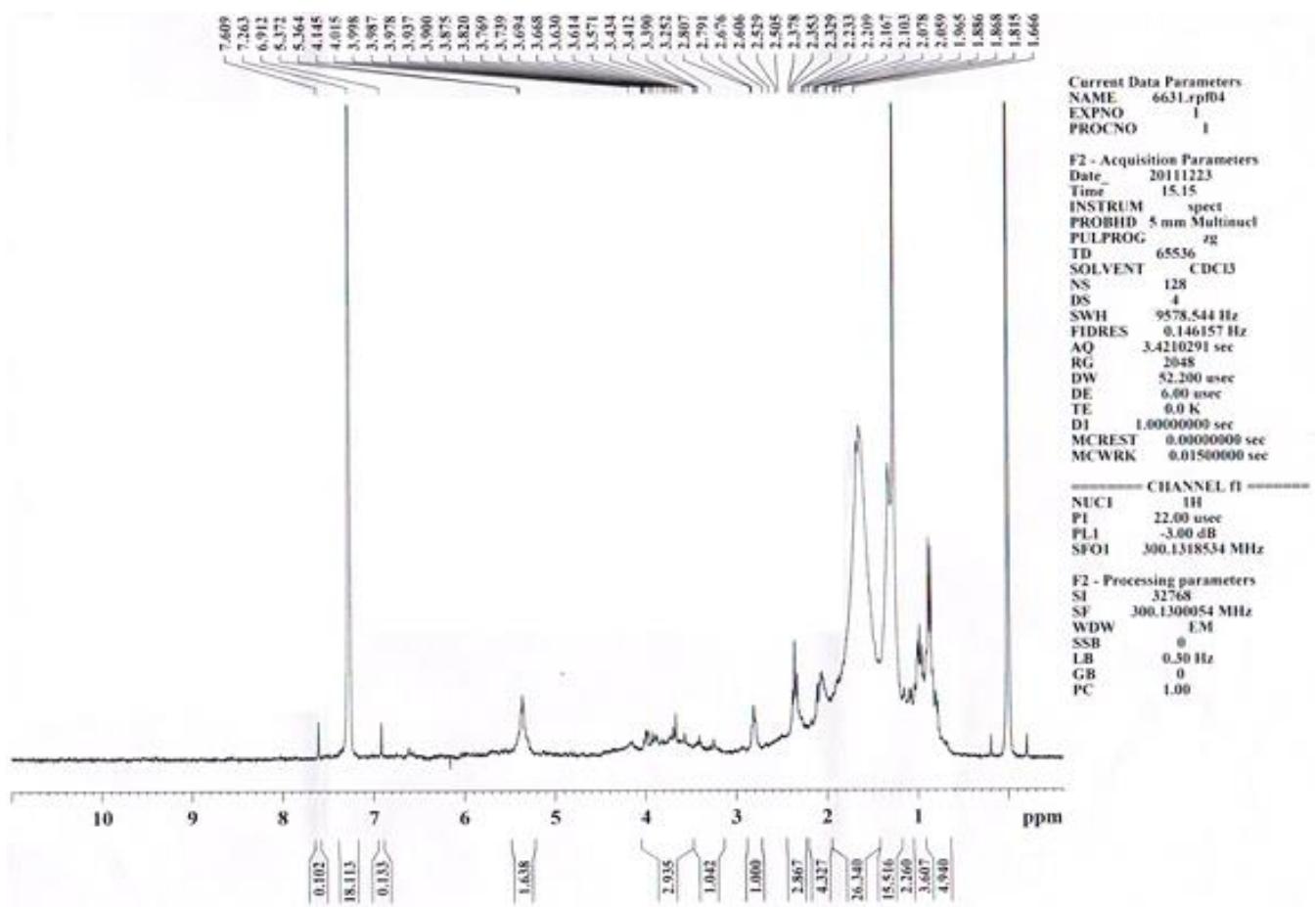


Fig. 1: IR spectra of chloroform leaf extract of *A. carnosus*

Table 1. IR, NMR and MS data of chloroform extract of *Anisochilus carnosus*.

Ft IR	Wave number (cm ⁻¹)
	1457 C–N – Stretching
	1723 C=O – Stretching
H1 NMR	Peak at following δ value

	δ 7.5-8.1 ppm five membered ring-proton C-C-H
	δ 1.2-1.5 ppm C-H proton for CH ₃ group
	δ 1.6 – 1.8 ppm C-H for CH ₃ due to electronegative nitrogen
Mass	Molecular ion peak [C ₈ H ₁₅ NO] 141.31 Small fragment [C ₂ H ₃ O] 43 Larger fragment [C ₆ H ₁₂ N] 98
Predicted chemical structure	
Chemical formula of predicted structure	C ₈ H ₁₅ NO

Fig. 2: NMR spectra of Chloroform leaf extract of *A. carnosus*

Earlier reports on phytochemistry of *A. carnosus* showed that, it is rich in phytochemical composition. It contain flavonoids like leuteolin and apigenin (Khare, 2007), triterpenoids, phytosterol, saponin, and also rich in essential oil composition such as carvacrol, alpha-cis- burganotene, caryophyllene, b- sellinene and camphor (Kulandhaivel et al., 2011 and Lobo et al., 2012). Some workers reported that the plant was highly rich in phytochemicals including alkaloids and also isolate steroids like stigmasterol and b-sitosterol from its extract (Kulandhaivel et al., 2011; Lobo et al., 2012; Imran, 2013 and Bhagat, et al., 2014). Due to availability of these active

compounds the plant possesses Antimicrobial, anticancer, cytotoxic and hepatoprotective properties (Grover et al., 2001; Mohammed et al., 2008; Muthuraman et al., 2012; Bhagat et al., 2014 and Reshi et al., 2018). In the present report, authors have revealed presence of a unique hygrine like compound from the chloroform extract of *A. carnosus* which was not reported earlier from any member of lamiaceae. This is probably first report of this kind. Hygrine was earlier reported in the leaves of *Erythroxylum coca* var. *coca* by Glass (1995). Hygrine is one of the important intermediate in synthesis of tropane alkaloids and its level regulates synthesis of various phytochemical related to different medicinal properties (Junker et al., 2013).

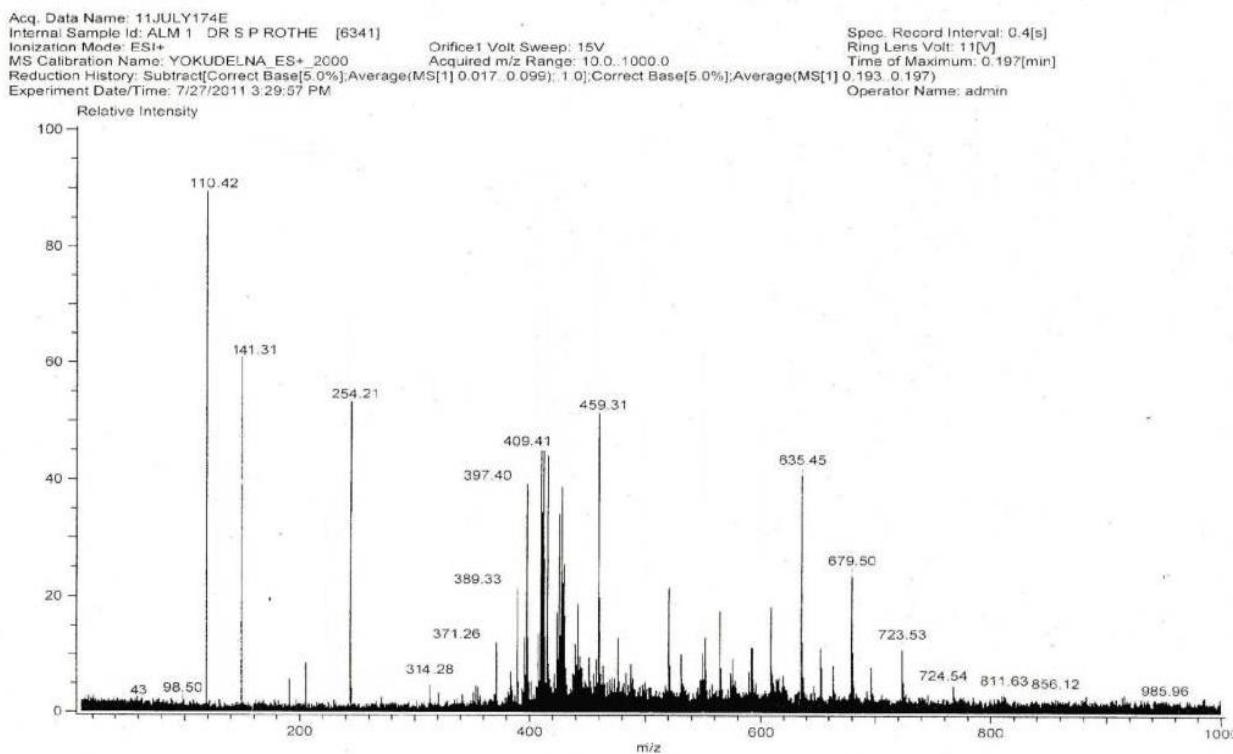


Fig. 3. Mass spectra of chloroform leaf extract of *A. carnosus*

4. CONCLUSION

Anisochilus carnosus is one of the most important Indian medicinal plant, rich in phytochemical composition with diverse medicinal properties. This report indicate presence of a new compound in chloroform leaf extract of the plant. On the basis of its FTIR, NMR and Mass analysis, the compound was interpreted to be hygrine, which is a pyrrolidine alkaloid and has role in synthesis of tropane alkaloids.

Acknowledgement

The authors extend the gratitude towards the Principal of both colleges, Shri Shivaji College Akola and Dr. R. G. Rathod College, Murtizapur for providing necessary facilities and thanks are also due to CDRI Lucknow for providing timely reports of FTIR, NMR and Mass analysis of samples.

Funding:

This study has not received any external funding.

Conflict of Interest:

The authors declare that there are no conflicts of interests.

Peer-review:

External peer-review was done through double-blind method.

Data and materials availability:

All data associated with this study are present in the paper.

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